

# Lavender Ribbon Report

# BEST PRACTICES for Preventing Firefighter Cancer



11 ACTIONS TO HELP MITIGATE  
THE RISK OF CANCER



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# **BEST PRACTICES**

## **for Preventing Firefighter Cancer**

11 ACTIONS TO MITIGATE THE RISK OF CANCER



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## VCOS VISION STATEMENT

To provide chiefs and chief officers who manage volunteers within a volunteer or combination fire, rescue or EMS delivery system with information, education, services and representation to enhance their professionalism.

## VCOS MISSION STATEMENT

To represent the interests of all volunteer and combination fire/rescue/EMS agencies. We will be a dynamic organization characterized by our integrity, customer focus and membership development, with value placed on people and the superior utilization of technology. We will excel by creating educational programs through unrivaled networking and by helping VCOS members further their success and reach their potential.



## NVFC VISION STATEMENT

The NVFC's vision is to be the leading advocate and resource organization for the American volunteer fire, emergency medical and rescue services.

## NVFC MISSION STATEMENT

To provide a unified voice for volunteer fire/EMS/rescue organizations. This mission will be accomplished by:

- Representing the interests of the volunteer fire, emergency medical, or rescue organizations at the U.S. Congress and federal agencies
- Promoting the interests of the state and local organizations at a national level
- Promoting and providing education and training for volunteer fire, emergency medical, or rescue organizations
- Providing representation on national standard-setting committees and projects
- Gathering information from and disseminating information to volunteer fire, emergency medical, or rescue organizations.



August 2018

Members of the Fire and Emergency Services,

The International Association of Fire Chiefs' Volunteer and Combination Officers Section (VCOS) and the National Volunteer Fire Council (NVFC) are proud to release this important report focused on providing actions to reduce the risk factors of cancer in the fire service. Unfortunately, this topic has had a significantly increasing impact on firefighter health and welfare. We have started to see great strides by departments and responders everywhere in combatting and preventing cancer, but more still needs to be done. The time is NOW to make changes.

Our hope is that this report provides a helpful summary of best practice solutions to implement in your departments to prevent cancer. We've aimed to keep this report focused and easily digestible to give you real takeaways and solutions. Divided into 11 best practices, the report provides background information, statistics, resources and action items to put into place.

It is imperative that local leaders take this report to heart and spend the time and energy to make changes to improve the safety and health of responders. Too often, we hear about firefighters suffering from and dying of cancer. What if we had done things differently and washed our personal protective equipment (PPE) thoroughly and stored it in a better way? There are many relatively cost-effective actions that can be taken to make a difference.

As one firefighter with cancer stated, "Every one of us in this business has thought of the end results of a lifetime of carcinogens. You just do. But in true fashion, I never believed it would happen to me." We must all take personal responsibility and accountability to act and create change.

The VCOS and NVFC leadership would like to thank the committee that worked diligently to put this report together. A lot of hours and hard work went into compiling this report.

We dedicate this report to those responders that are battling or have lost their battle with cancer. Let's all pledge that we will do better to implement cancer prevention practices in honor of those responders.

Thanks for taking the time to read this report. Please help us distribute this life-saving information. Stay safe out there.

For more information about VCOS, visit [vcos.org](http://vcos.org). For more information about the NVFC, visit [nvfc.org](http://nvfc.org). For additional cancer resources, go to [firstrespondercenter.org/cancer](http://firstrespondercenter.org/cancer).

Sincerely,

Chief Timothy S. Wall

*Chair, Volunteer and Combination Officers Section  
International Association of Fire Chiefs*

Chief Kevin D. Quinn

*Chair, National Volunteer Fire Council*



The issue of occupational cancer has been on the forefront of firefighter safety for the past few years. Cancer is now recognized as one of the major killers of both career and volunteer firefighters, which we in the public safety community have only recently begun to admit. It is our duty to accept the need to change the safety culture as it relates to occupational cancer. The impact cancer brings to our family, children, friends and colleagues can no longer be ignored. The carcinogens associated with the building industry, as well as the fire-retardant materials found in homes and business today impact all public safety response personnel. This report provides information for members of the response community on the actions necessary to protect ourselves from occupational cancer. We have named it the *Lavender Ribbon Report* since lavender is the symbol for general cancer awareness and represents ALL cancers.

Chief James P. Seavey Sr.



# BEST PRACTICES

## for Preventing FIREFIGHTER CANCER

- 1 Full protective equipment (PPE) must be worn throughout the entire incident, including SCBA during salvage and overhaul.
- 2 A second hood should be provided to all entry-certified personnel in the department.  
Following exit from the IDLH, and while still on air, you should begin immediate gross decon of PPE using soap water and a brush, if weather conditions allow. PPE should then be placed into a sealed plastic bag and placed in an exterior compartment of the rig, or if responding in POVs, placed in a large storage tote, thus keeping the off-gassing PPE away from passengers and self.
- 3 After completion of gross decon procedures as discussed above, and while still on scene, the exposed areas of the body (neck, face, arms and hands) should be wiped off immediately using wipes, which must be carried on all apparatus. Use the wipes to remove as much soot as possible from head, neck, jaw, throat, underarms and hands immediately.
- 4 Change your clothes and wash them after exposure to products of combustion or other contaminants. Do this as soon as possible and/or isolate in a trash bag until washing is available.
- 5 Shower as soon as possible after being exposed to products of combustion or other contaminants. "Shower within the Hour"
- 6 PPE, especially turnout pants, must be prohibited in areas outside the apparatus floor (i.e. kitchen, sleeping areas, etc.) and never in the household.
- 7 Wipes, or soap and water, should also be used to decontaminate and clean apparatus seats, SCBA and interior crew area regularly, especially after incidents where personnel were exposed to products of combustion.
- 8 Get an annual physical, as early detection is the key to survival. The NVFC outlines several options at [www.nvfc.org](http://www.nvfc.org). "A Healthcare Provider's Guide to Firefighter Physicals" can be downloaded from [www.iafc.org/healthRoadmap](http://www.iafc.org/healthRoadmap).
- 9 Tobacco products of any variety, including dip and e-cigarettes should never be used at anytime on or off duty.
- 10 Fully document ALL fire or chemical exposures on incident reports and personal exposure reports.
- 11

FUNDING PROVIDED BY



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# FORWARD

The National Fallen Firefighters Foundation (NFFF), International Association of Fire Chiefs (IAFC), Volunteer and Combination Officers Section (VCOS) and National Volunteer Fire Council (NVFC) have all hosted important cancer prevention and awareness sessions and programs. Statistics have repeatedly shown that occupational cancer is a serious threat to firefighters. We all need to change what we are doing each day so that we lessen our risks.

What cancer is doing to our fire/rescue/EMS family is a *fact*. This new awareness is our call to action. There will never be a time more important than *now* to take personal responsibility to act!

This report outlines 11 best practices to live by—each and every day—so we can change the culture that is killing our first responders.

The nation's fire service is clearly seeing the adverse effects of firefighters getting cancer due to the carcinogens and other contaminants picked up in fires, overhaul, training and residual off-gassing from our PPE. Cancer has become the second leading cause of deaths for firefighters throughout this country (Firefighter Cancer Alliance). It has become an epidemic that is killing our fellow firefighters and friends. Every firefighter likely knows at least one fellow firefighter impacted by this disease.

The National Institute for Occupational Safety and Health (NIOSH) launched a multiyear study in 2010 to examine if firefighters have a higher risk of cancer due to job exposure (Daniels, 2017). The study found that firefighters have a 9 percent higher risk of being diagnosed with cancer and a 14 percent higher risk of dying from cancer than the general population. In addition, another study found that firefighters have a much higher risk than the general public of certain types of cancer, including double the risk of testicular cancer or mesothelioma. The risk of multiple myeloma, non-Hodgkin's lymphoma, skin cancer, malignant melanoma, brain cancer, prostate cancer, colon cancer and leukemia are also higher for firefighters than the general public (LeMasters et al, 2006).

## WHO IT AFFECTS?

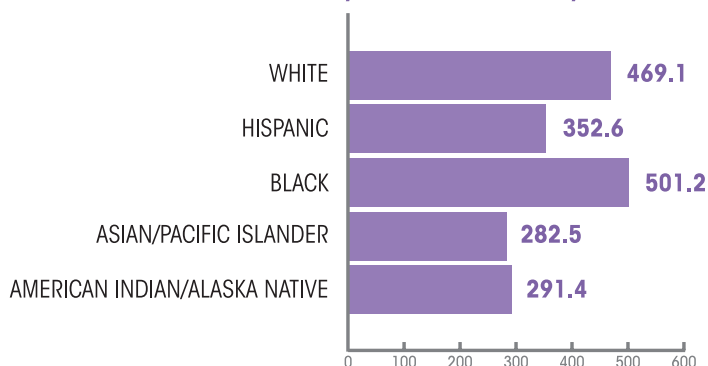
In a world that still struggles with inequalities, cancer is an equalizer. It doesn't discriminate. It assaults everyone without concern for race, gender, age, ethnicity, religion, or sexual orientation. Below are two graphs from the Centers for Disease Control and Prevention (CDC) that show the breakdown between male and female cancer rates by race and ethnicity from the general population (more information on cancer rates in the general public can be found at [www.cdc.gov/cancer/dcpc/data/race.htm](http://www.cdc.gov/cancer/dcpc/data/race.htm)) (U.S. Cancer Statistics Working Group). Cancer also shows no discrimination in the fire service from career or volunteer, from metropolitan city to rural areas, from rookie to senior firefighter, or even from an entry firefighter to the fire chief.

More research needs to be done to broaden the demographic data concerning cancer in the fire service, but it is clear that the only way to lessen the risks is through action. Cancer is a debilitating disease, and we must work to protect the members of our organizations. We must reject the old way of doing things in favor of new ways that keep our members safe. Gone are the days when dirty gear was accepted and SCBA was removed before the smoke cleared. We must embrace a new way forward that puts the well-being of our members first and rejects practices that have a detrimental impact. Our culture must change to ensure our health and safety is at the forefront of our departments.

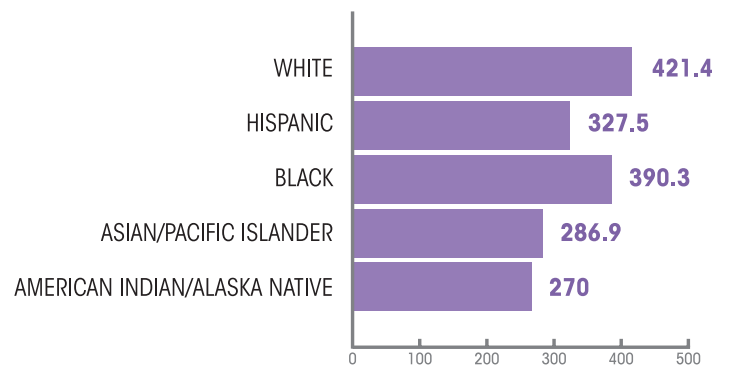
## RATE OF CANCER – ALL TYPES

RATE PER 100,000 PEOPLE

### Males by Race/Ethnicity



### Females by Race/Ethnicity



2015 Data found at [www.cdc.gov/cancer/dcpc/data/race.htm](http://www.cdc.gov/cancer/dcpc/data/race.htm) (U.S. Cancer Statistics Working Group)

# INTRODUCTION

The fire service is faced with one of the most important cultural changes in our history. This change will dictate the way we do business and the way we take care of ourselves on the fireground and at our stations. It starts with the realization that cancer is an epidemic that is currently decimating our profession.

Fortunately, there are specific actions that individuals and departments can take to protect themselves. As the realization of the magnitude of firefighter cancer is becoming more and more evident, the International Association of Fire Chiefs' Volunteer and Combination Officers Section and the National Volunteer Fire Council, along with the Fire Service Occupational Cancer Alliance, Firefighter Cancer Support Network, with support from California Casualty, developed the 11 Best Practices for Preventing Firefighter Cancer. This report is an expansion of these best practices in order to provide specific guidance on how to adopt these actions into the everyday culture of fire departments.

In order to accept a culture change, it is important to understand why it is needed. The obvious reason is to protect and save firefighters. But in reality, it goes far beyond that. This culture change is not just about you and me. It's about the people in our lives we go home to after every call. It's about those we leave behind at the dinner table and whose sporting events and school concerts we miss. It is also about the community members we serve and make these sacrifices for. And it is about our fellow crew members who count on us. We cannot ignore our health when so many people depend on us.

Fire service organizations across this nation must work to provide answers and assistance in reducing the statistics of firefighter cancer, and each local department must put the wellbeing of their responders first. The best practices presented in this guide should be adopted by every department and included in standard operating guidelines/procedures. Use this report to implement a department cancer awareness and prevention initiative and to create a culture where health and wellness are top priorities.

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## BEST PRACTICE 1:

**Full personal protective equipment (PPE) must be worn throughout the entire incident, including a self-contained breathing apparatus (SCBA) during salvage and overhaul.**

### WHY FULL PERSONAL PROTECTIVE EQUIPMENT?

While culture change is often looked at as doing away with 100 years of traditions in our stations, it truly isn't. Instead, maybe we should call it a "repositioning of culture," which is to say, the reconstruction of the cultural concepts found in our fire service society of today. As we learn more, we must adjust and adapt to current knowledge. In other words, building on the past while creating the future!

The first step in meeting this goal is to be sure that full PPE, including SCBA, is worn throughout the entire incident, including salvage and overhaul. Researchers have found that the inhalation hazard is just one of the major cancer risks (Taking Action Against Cancer, 2013, p. 3). Cancer-causing contaminants can also be found on firefighters' turnout gear from the materials consumed during structural firefighting and training. The skin is the body's largest organ in surface area, and it can be highly absorptive. The Firefighter Cancer Support Network's *Taking Action Against Cancer in the Fire Service* white paper explains that "the skin's permeability increases with temperature; for every five-degree increase in skin temperature, absorption increases 400 percent." The U.S. Department of Health and Public Services reports that "the neck area is one of the most likely areas of a firefighter's body to become contaminated with potential carcinogens" (Fent et al., 2013, p. 17).

Fires of today are drastically different than in the past. Studies conducted by Underwriters Laboratories (UL) have found that while people had an average of 17 minutes to escape home fires 30 years ago, this time has been reduced to only 3-4 minutes today (Rosen & Davis, 2016). Thus, today's firefighters are rolling up to more intense blazes that are burning hotter and faster than ever before. Research also shows that "firefighters are now more likely to be exposed to hazardous materials during a structure fire than during an actual hazardous materials incident" (Jahnke et al., 2016, p. 5). Because of changes in building components and the materials and chemicals used in home furnishings, most structure fires create large volumes of hazardous gases and particulates, some of which are persistent and may remain in the environment. Therefore, the need to wear full personal protective equipment, including SCBA, during overhaul is crucial to beating occupational cancer.



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## BEST PRACTICE 2:

### **A second hood should be provided to all entry-certified personnel in the department.**

Issuing entry-certified personnel a second hood sounds much harder than it is. When you say “second” anything, all most fire chiefs hear are nails scraping down a chalkboard. The thought of spending money on a second hood makes them think of all the other things they won’t be able to buy this budget year. As the money is spent on these additional hoods, they can envision their tax boards or donors saying, “Do you really need that?” The simple answer is yes.

Yes, because our personnel are worth it. They step away from their jobs, they miss time with their families, and they risk their lives each and every day for their communities. So yes, they do really need that second hood. They are the most valued asset a department has, and chiefs need to do anything and everything they can to take care of them. That means taking action to prevent them from getting cancer. It is worth it to prevent a firefighter from becoming another statistic. It is also important to the community as a whole, which depends on healthy, active firefighters to protect and serve.

#### **WHY A SECOND HOOD?**

The need for a second hood for all entry-certified personnel is based on the fact that most sock hoods offer limited smoke protection on their own. In a 2015 article from [firerescue1.com](http://firerescue1.com), research was highlighted that showed “a large amount of exposure occurs to the vulnerable face and neck area that is not protected by the SCBA facepiece” (J. Stull & G. Stull, 2015).

The second hood is needed to make sure that firefighters don’t have to wear contaminated hoods after firefighting. Providing each firefighter with a second hood allows the firefighters to wash their contaminated hood, while still having the second hood available to use for another emergency. Wearing any hood is better than no hood, but providing each firefighter with two is best.

#### **CLEAN YOUR HOODS**

The National Fire Protection Association provides a guide via a bulletin about how they want the fire service to be aware of the following to reduce potential contaminant exposure (NFPA, 2017).

- Protective hoods are in direct contact with the skin.
- The face and neck have been identified as significant areas of dermal exposure to products of combustion and potential carcinogens.
- Firefighter protective hoods are potential carriers of harmful products.

It is very difficult to see the amount of soot and contaminants on a hood unless it is soaked in a bucket of soap and water. As the water begins to turn brown, and in some cases black, only then can one get a glimpse of how dirty it is. Hoods need to be washed immediately upon returning to the station, if not on scene before. Carrying around a dirty hood isn’t a sign of toughness, it’s a sign of lack of care and a failure to take care of your personal protective equipment.

Most firefighters perform gross decontamination of their gear on scene but don’t wash their hood after they return to the station. They either forget or else don’t want a drenched hood to re-don if another structure fire is dispatched. The Firefighter Cancer Support Network’s “Wash Your Hood Sunday” is a great way to bring awareness to firefighters about maintaining a clean hood but washing your hood once a week might not be enough. What is needed is to wash all gear, including the hood, after each fire event.

In accordance with NFPA 1851, firefighters should follow these practices to keep a clean hood:

- Wash protective hoods after every fire or emergency service use.
- Inspect for damage and continued serviceability after every fire or emergency service use.
- Do not allow protective hoods to be taken home, to a laundromat, or to a dry cleaner for washing.

## NEW MULTILAYER HOODS DESIGN

As technology evolves and manufacturers try to keep up with the ever-changing fire service and more specifically the ever-changing personal protective ensemble, it becomes clear there is a need for a better protective hood. Not just better for heat protection, but better for hazardous environment protection.

Multilayer hoods provide a particulate barrier in them in an attempt to reduce the amount of particulates that make contact with the firefighter's skin. However, as more material is added to the hood, it also adds weight and restricts the ability for the firefighter to remove heat from their head. This is something that needs to be further studied and monitored to ensure additional stress isn't added to firefighters.

The sock-style hood does not likely stop all the particulates and carcinogens from getting on the skin. As a hood stretches over a firefighter's head and around the facepiece, the knitted material also stretches, allowing the nasty, cancer-causing particulates to directly contact the neck and jaw line. Those areas of the skin are one of the most susceptible to dermal absorption due to the skin's thinness. Even though the protective hood is part of an ensemble with the coat collar, facepiece and helmet earflaps, particulates can still make it through to the skin.

North Carolina State University's Textile Protection and Comfort Center, in conjunction with the Department of Homeland Security Science and Technology Directorate's First Responders Group and LION First Responder PPE Inc., conducted fluorescent aerosol testing of firefighters in complete personal protective equipment, including a standard sock hood. The results show how much aerosol made it through the hood and contacted the firefighters' head, neck and jawline (Responder News, 2016).

The green areas indicate where the fluorescent dyed particulates accumulated on the neck and jawline of the test subject wearing standard firefighter PPE.





These results show the absence of particulates on the neck, shoulders and jawline of the test subject using the Smoke and Particulate Resistant Structural Turnout Ensemble prototype when used with one of the COTS particulate barrier hoods that are now available on the market (Responder News, 2016).

Until these new multilayer style hoods become the new norm, the need for a second hood is still on the forefront. Keeping hoods clean helps protect the skin areas that are most susceptible to particulates entering the body, which reduces the chances of getting occupational cancer.

## **GET THAT HOOD OFF**

How common is it to see firefighters on scene walking around with the sock hood pulled down around their neck? It is clear these hoods are dangerous purveyors of carcinogens! Why would you want to have it tightly wrapped around the most vulnerable part of your body? As firefighters work and sweat, the contaminants that didn't pass through the hood initially but instead held up residence in the hood are now working their way into the skin. Get that hood off as soon as possible and wipe down the areas around the head, neck and jawline with wipes or soap and water. Wearing the hood during the overhaul phase is a must to keep down the exposure to the carcinogens. Once the fireground tasks are concluded, (whether that is suppression, search or overhaul) get out of the environment, get through the decontamination process and remove the hood. The faster the hood is removed and the skin is cleaned, the faster those cancer-causing contaminants will be off the skin. Take a look at the following video from the Illinois Fire Service Institute for more information: <https://t.co/sWatoTAXDd>.

## **A CALL FOR CHANGE**

Many fire departments, especially volunteer and small-town departments, find that issuing two complete sets of turnout gear to their members is cost-prohibitive. However, issuing two hoods to each firefighter is more attainable and has a direct impact on their members' health. It allows each firefighter to immediately wash his or her hood upon returning from each structure fire.

The ability to gross decontaminate gear on scene is easily accessible. A low-pressure stream from a garden hose attachment on the pumper allows firefighters to remove the large particles and contaminants from their gear. In addition, the multilayer system that is found in turnouts helps protect firefighters from having contaminants reach the skin. The one piece that lacks the specific barrier properties is the hood. Issuing each entry-certified firefighter a second hood allows them to don a clean, noncontaminated hood for the next fire event they attend. Continuing to re-don and doff a contaminated hood does nothing more than expose firefighters to the cancer-causing contaminants lingering in the hoods. When the firefighter has accessibility to a second hood, or a hood exchange program, they can immediately use this clean hood and decontaminate the originally used hood.

Having a second hood that can be put into service immediately gives the firefighters a sense of security about washing their currently used hood. Most firefighters always want to be response-ready. The thought of missing the next fire or call for service due to not having a firefighter hood would nauseate most. Giving them a second hood is safer for their health and allows them to remain response-ready. In small communities that only have a few firefighters at each scene, having the staff out of service without hoods just isn't an option.

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## BEST PRACTICE 3:

**Following exit from the immediately dangerous to life or health (IDLH) incident and while still on air, you should begin immediate gross decontamination of PPE using soapy water and a brush if weather conditions allow. PPE should then be placed into a sealed plastic bag and placed in an exterior compartment of the apparatus, or, if responding in personally owned vehicles, placed in a large storage tote, thus keeping the off-gassing PPE away from passengers and self.**

There was a time when dirty bunker gear was a badge of honor. Over the past few years, firefighters have become more aware of the dangers they face in regard to occupational cancer. Many types of occupational cancer originate from coming into contact with dirty or contaminated gear. The only protection against this danger is to clean the gear to remove the harmful particles and chemicals. This starts with performing gross decontamination (decon) immediately following an incident. The fire service community must use this knowledge to make the dirty, salty-looking firefighter a thing of the past and instead embrace clean gear as the new badge of honor.

### GROSS DECONTAMINATION POST-FIRE ON SCENE

Special thanks to Florida Firefighter Safety and Health Collaborative for sharing their recommended SOG with us. The following information comes primarily from their SOG with only slight modifications, based on the research we conducted for this report. You can access their SOG template to be used in your department at their website at <https://www.floridafirefightersafety.org/media/attachments/2017/06/24/post-fire-on-scene-decon--ffshc-state-face--final-draft-6-13-17.pdf>.

**Decontamination** has two definitions.

The first from Business Dictionary is "The removal of hazardous substances (bacteria, chemicals, radioactive materials) from employees' bodies, clothing, equipment, tools and/or sites to the extent necessary to prevent the occurrences of adverse health and/or environmental effects."

The second from the Free Dictionary is "To make safe by eliminating or reducing poisonous or otherwise harmful substances, such as noxious chemicals or radioactive materials."

Decontamination may be necessary for exposed or contaminated civilians and emergency responders. There are two types of decon:

1. Emergency/gross decon
2. Technical/secondary decon

The decon process described in the following SOGs strictly refers to an immediate gross decon following exposure to productions of combustion. This procedure shall be systematic and orderly.

The gross decon process shall be utilized for all fires where PPE is worn and exposed to products of combustion. This shall include, but not be limited to structure fires, brush fires, vehicle fires, training fires and any other emergency or non-emergency incidents where the combustion process occurs.

The marking of formal isolation or control zones (as shown below) may not occur at every fire incident, and personnel should be aware that isolation or control zones still exist. Research has shown modern fires generate many harmful products of combustion, which may include polycyclic aromatic hydrocarbons [PAH], volatile organic compounds [VOC], carbon monoxide [CO], hydrogen cyanide [HCN] and numerous other gases, chemicals and toxins (*State FACE Team Recommended SOG 3*). It is important to remember that many of these toxins are colorless or odorless gasses that will not be identifiable. To limit the amount of exposure and the subsequent required decon, consider apparatus placement and approach during any fire attack. Personnel may be able to reduce the amount of exposure by performing a fire attack from the upwind position, when possible, and utilizing the reach of the hose stream (3).

The following zones shall be defined on all fire type incidents:

#### **Hot Zone**

- Any area with high risk.
- Any area within the immediate perimeter of any fire or products of combustion (which include smoke and soot).

#### **Warm Zone**

- The area between the hot and cold zones.
- The area not in the immediate vicinity of any fire or products of combustion.
- Gross decon and cleaning of the body shall be located in the warm zone.

#### **Cold Zone**

- Any area without risk.
- Any area outside of the hot and warm zones, ideally uphill or upwind.
- Rehabilitation (rehab) shall be located in the cold zone.

### **PREPARATION**

Personnel shall be ready at all times to implement these protective procedures. Personnel may find it beneficial to assemble and maintain a personal go bag with a clean uniform or Tyvek suits that can be accessed after any incident where they've been exposed to harmful substances. Recommended items could include a department-approved uniform or jumpsuit, socks, clean footwear, hat, towel and a spare set of turnouts.

The driver/operator shall ensure that the apparatus tank water (or any water used in the decon process) is from a clean, municipal (hydrant) water source and is not from a stagnant or potentially contaminated water source.

### **GROSS DECON SETUP**

Generally, gross decon should be set up by the first arriving suppression apparatus closest to the incident where products of combustion exist. It shall be the driver/operator's responsibility to establish and oversee the gross decon area and process. Where resources are sufficient, it is beneficial to assign an additional crew to oversee the decon process. The gross decon area shall be designated by deploying an approved decon hose line and marking the nozzle location with an alternative colored traffic cone or flagging.

*Option (Preferred)—Decon line setup: The decon hose line(s) shall include an inline pressure regulator with a garden-style hose and nozzle. This setup can be facilitated using a 2 1/2 to 3/4 (GHT) reducer. This garden hose setup is preferred as it will provide a flushing with sufficient flow but lower water. It is also easier to control water flow and direction while performing the gross decon process. To facilitate gross decon of multiple personnel, additional decon hose lines from other nearby suppression apparatus can be used.*

*Option—Decon line setup: The decon hose line(s) can be a jump line, 1 3/4, or booster line (hose reel). The driver operator will ensure that the pressure on this line is as low as possible. Hydrant pressure is usually sufficient. With this setup, it is important to be mindful of water flow direction as random or haphazard direction can potentially saturate interface areas and lead to the interior of the gear getting overly wet. To facilitate gross decon of multiple personnel, additional decon hose lines from other nearby suppression apparatus can be used.*

*Option—For larger or more complex incidents, the decontamination function should occur in “base” as the facility is described in the National Incident Management System under the oversight of a base manager or logistics section chief. This distinction is important to ensure that contamination is addressed in out-of-service work groups and not transmitted to a staging area where in-service resources are positioned.*

## **GROSS DECON PROCESS**

All fire personnel who were exposed to products of combustion shall perform gross decon prior to entering rehab or leaving the incident scene. After exiting the hot zone, it is recommended that crews remain on air, when possible, and report directly to the designated decon hose lines.

Note: Members with the lowest air supply should be decontaminated first, and, as a rule, personnel are to remain on air until gross decon is complete, when possible. Maintaining crew integrity, they shall assist each other in rinsing off debris and products of combustion in a systematic and thorough manner from the collar line down, being mindful of higher potential collection points such as the armpit and groin areas. Personnel shall be careful not to saturate the inner lining of the PPE. The goal is to keep the PPE operationally dry on the interior but rinsed as clean as possible on the exterior. Soft bristle scrub brushes and department-approved soap/cleaner may be used to facilitate the cleaning process. Follow NFPA 1851 and the manufacturers’ recommendations when cleaning PPE.

After rinsing the exterior portion of the PPE, personnel may go off air and begin to doff their PPE. Depending on the extent and length of the fire, all PPE, other than bunker pants and fire boots, shall be left in a prepared drop zone. If a formal rehab area is not established due to a quicker knock down or demobilization, a drop zone may not necessarily be needed.

The drop zone shall be located in the warm zone. The drop zone shall be remote and downwind of rehab due to off-gassing PPE. Placement of tarps or salvage covers is suggested to designate this area. Next, personnel shall move away from the exposed gear and toward the cold zone and use department-approved wipes for a gross cleaning of their head, neck, face, hands and any other exposed areas as deemed necessary. The use of running water (a hose bib for instance) with department-approved soap/cleaner (if available) for those same body areas is an optional method for on-scene gross cleaning. This should not be considered a substitute for a thorough “shower within the hour.”

Personnel must resist the urge to consume food until the gross decon process is completed and they have entered a clean rehab area (the cold zone).

### **Reporting to rehab**

Personnel that report to rehab shall first go through the gross decon process. Once in rehab, personnel shall lower (or preferably remove if alternative footwear is available) their bunker pants to allow for rapid cooling and increase the distance between off-gassing contaminated gear and their groin and respiratory system.

## Reporting for reassignment

When crews are called from rehab back into operations, they shall report ready for assignment as requested. If any new assignment involves further exposure to products of combustion (i.e., overhaul, secondary search, retrieving hose lines, etc.), the crew shall subsequently go back through the gross decon process as stated above.

## Release from the scene

To keep the cab of the apparatus as clean as possible and to avoid transferring toxins and harmful products back to the fire station, it is extremely important to perform gross decon prior to leaving the incident scene.

Once released by command and prior to leaving the scene, it is recommended that all PPE be bagged at the scene using department-approved bags that are at least 6 mm thick. The bag opening will be twisted and taped or otherwise closed, then goosenecked (folded over on itself and then twisted and taped) or otherwise closed a second time. This procedure will likely minimize secondary exposures to any off-gassing. When practical, all bags are secured on the outside of the apparatus and not inside the passenger cab.

## HELMETS AND EQUIPMENT

Decontamination of the helmet will follow the same objective as all PPE for gross decon. When cleaning the helmet, it's acceptable to carefully wash the exterior to remove any heavy particulate. However, when cleaning the interior, do not saturate any fabric, including the liners, with water. Any interior cloth pieces should be wiped down with department-approved wipes. Removable soft goods may allow more thorough cleaning based on manufacturers' recommendations.

All other equipment (SCBA packs and cylinders, tools, radio straps, etc.) will be thoroughly cleaned using water and any available department-approved cleaner (unless specified below). Soft bristle scrub brushes should be used. Radios shall be cleaned using appropriate techniques, referring to equipment manufacturer's guidelines. Once the equipment is cleaned, it may then be loaded into the apparatus cab. Ideally, no potentially contaminated equipment will be stored in the apparatus cab.

*Option (Preferred)—Clean Cab Concept: No equipment that has its designated use for interior firefighting shall be housed, bracketed, or otherwise kept in the interior passenger compartment of any response vehicle. The cab shall be considered a safe, clean place for fire rescue personnel and free of contamination. By establishing a clean cab concept for apparatuses, it reduces any potential secondary and tertiary exposures and establishes a high standard for all to follow.*

## BACK AT THE STATION

The steps that shall be taken immediately upon arrival at the fire station include, but are not limited to, the following:

- Perform a more thorough decontamination of equipment (radio, tools, fire hose, etc.) following manufacturers' recommendations.
- Perform a more thorough decontamination of PPE (helmet, bunker gear, SCBA, etc.) following NFPA 1851 and manufacturers' recommendations.
- Perform a thorough decontamination of the apparatus cab.
- Return apparatus to a state of readiness.
- Take a "shower within the hour" after being exposed to any products of combustion.
- Change into clean station uniform wear.
- Units that have been approved to go out of service for decon shall be unavailable according to policy.

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## BEST PRACTICE 4:

**After completion of gross decontamination procedures as discussed above and while still on scene, the exposed areas of the body (neck, face, arms and hands) should be wiped off immediately using wipes, which must be carried on all apparatus. Use the wipes to remove as much soot as possible from exposed areas immediately.**

As discussed previously, research finds that the neck, face and hands are areas particularly susceptible to soot exposure at fire scenes (J. Stull & G. Stull, 2015). After completion of gross decontamination procedures and while still on scene, the exposed areas of the body (neck, arms and hands) should be wiped off immediately using wipes, which must be carried on all apparatus. Use the wipes to remove as much soot as possible from the head, neck, jaw, throat, underarms and hands immediately. The parts of a firefighter's body that are covered by their protective hood are the easiest places for fireground substances and carcinogens to meet the skin. That's because many hoods lack any type of barrier characteristics to keep out the superfine particles and soot that absorb a variety of hazardous chemicals including carcinogens. This decontamination wipe should be used before the firefighter handles any foods.

There have been concerns regarding what types of wipes should be used and where to get them.

The best takeaways are these:

- **Wipes are effective, but don't replace a shower.** Wipes are an effective tool for immediate decontamination and removal of toxins from the neck and other areas, but they cannot replace a shower. While repeated incident responses or volunteer firefighters returning to work may make this takeaway seem impossible, a thorough shower and hand washing need to be conducted as soon as possible after an incident.
- **Exposures happen anywhere on the fireground.** Exposures can occur even during an exterior attack, and efforts should be made for those doing an exterior attack to keep their hoods on during operations. We must be able to take a wide-angle photo of the incident, recognizing the dangers that all responders face.
- **Reducing exposure starts with prevention.** Reducing exposure to carcinogens is not going to occur with any one method. Prevention has to be an ongoing effort on every scene. Using a strong command process at all incidents will ensure that firefighter safety will be paramount.

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## **BEST PRACTICE 5:**

**Change your clothes and wash them after exposure to products of combustion or other contaminants. Do this as soon as possible or isolate in a trash bag until washing is available.**

### **POSTFIRE DECON AT THE FIRE STATION**

All personnel exposed to the products of combustion, or any potentially harmful chemical or toxins, should complete a full personal decon as soon as possible after the exposure. This includes gross decon as discussed in practice 3, the use of wipes on scene as discussed in practice 4, “shower within the hour” as discussed in practice 6 and properly cleaning all articles of clothing that were exposed.

“Shower within the hour” is a priority. Personnel that are deemed exposed by the incident commander need to be placed out of service until their personal decon is complete. The incident commander should consider exposed personnel as those that performed interior fire attack, primary search, overhaul, roof or ventilation operations and the like. Further consideration for placing personnel out of service should be given to others on the scene. The incident commander should also evaluate other personnel working outside the IDLH environment as they may have been exposed due to wind shift. Showering shall be accomplished with the department-approved soap, if available, with the goal to reduce the absorption rate of toxins into the body. It is extremely important to use, when available, the department-approved wipes and soap for personal decon post fire. These products are not for standard use.

### **ABILITY TO RESPOND**

Back at the station:

Firefighter protective clothing must be kept clean to ensure its proper performance. Turnout clothing needs to be cleaned regularly to prevent any problems. Proper cleaning is important because improper cleaning can destroy clothing or worsen its protective performance.

Research has proven that advanced cleaning is more thorough and must be done at least every year or more frequently, depending on the use and condition of the clothing (J. Stull & G. Stull, 2014). We recommend cleaning every six months or more frequently, depending on the use and condition of the clothing. Advanced cleaning involves hand washing the clothing in a utility sink or machine washing.

In either case, proper procedures must be followed. Machine washing is best done in a front-loading washer/extractor to limit damage caused by top-loading machine agitators. While these can be very expensive for smaller department budgets, using detergents specifically for turnout gear along with water and brushes can work as well.

Proper drying is equally important. As turnout clothing is thick and bulky, drying is slow. Nevertheless, machine drying at high settings will quickly ruin this clothing (even though rated for high-temperature use). If machine drying is selected, be sure to use a no-heat setting.

It is best to hang clothing for air drying inside and away from direct light, especially sunlight. The ultraviolet radiation in sunlight breaks down some of the fibers in turnout clothing. Drying time can be reduced by using a fan with heated air over the clothing.

In some cases, clothing can be contaminated by chemicals or bloodborne pathogens. When this occurs, the turnout clothing must go through a specialized cleaning. Many departments also use contract facilities for cleaning their clothing.

*Option: For larger or more complex incidents, the decontamination function should occur in "base" as the facility is described in the National Incident Management System under the oversight of a base manager or logistics section chief. This distinction is important to ensure that contamination is addressed in out-of-service work groups and not transmitted to a staging area where in-service resources are positioned.*

Upon returning to the station, all gear that was bagged at the scene shall be removed from the bags. Appropriate PPE and respiratory protection should be followed during this process. The exterior shell shall be further decontaminated if needed, remembering to keep the inner liners dry and ready for response. The PPE should be hung to dry in a manner that allows for drying as well as good turnout times. Racks with hangers and fans can facilitate and speed up this drying process.

The best option shall be to use extractor washers and commercial dryers as outlined in NFPA 1851 and according to manufacturers' recommendations.

Note: If this occurs during the firefighter's shift, these methods require a second set of PPE.

Should the above options not be available, PPE ensembles should be cleaned as outlined in NFPA 1851 Routine Cleaning and according to manufacturers' recommendations. The PPE should then be hung on a rack to improve drying times and allow for the continued off-gassing. Fans should be used to facilitate this process. Since a proper routine cleaning also involves cleaning the interior liners of the gear, this gear shall be considered out of service until fully cleaned and dried.

If there is not an ability to exchange PPE during the shift, the NFPA 1851 Routine Cleaning of the PPE will occur at the end of the firefighter's shift.

## **MAINTAINING READINESS**

All personnel shall ensure their assigned unit has a clean apparatus cab. The potential for secondary exposures during routine apparatus use is high and must be limited. To aid in reducing secondary exposures, apparatus cabs shall be cleaned and decontaminated (at a minimum) on a monthly basis and more often if call load deems it necessary.



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## BEST PRACTICE 6:

### Shower as soon as possible after being exposed to products of combustion or other contaminants. “Shower within the hour.”

The days of arriving back to the station after a fire and having the top concern be to clean the fire apparatus are gone. The most pressing concern upon returning to the fire station is cleaning you. You are the most important tool on that apparatus, and you take the top priority of getting clean. The axes, halligans and pike poles can wait. You cannot!

While cleaning the apparatus and equipment are important, they are inanimate objects. Meanwhile, firefighters have the urgent responsibility to get their skin clean to ensure they are not absorbing toxic carcinogens. On the ride back to the station after the fire, the sweat and water of the scene begin to dry on the duty uniform. As the sweat and water evaporate, so does the thought of getting immediately out of it. Instead, attention tends to shift to what needs to be done to get the apparatus ready for service again. Filling SCBA bottles, cleaning tools, washing hose. Making sure the firefighters are ready for service falls down the list. This is an attitude that must be changed. Getting yourself clean and prepared for the next incident must be the top priority upon returning to quarters.

#### THE NEED TO SHOWER

Most people are educated to practice good hygiene from the time they are young. There is nothing different about that basic lesson when it comes to being a firefighter. In fact, it is even more important now because of the toxins and carcinogens that may be lurking on the skin. It is extremely important to get these off our bodies as soon as possible. The dirty, sweaty look of a firefighter might be good for television ratings, but it is detrimental to our health and wellbeing in the real world.

If firefighters don't immediately shower after an exposure to carcinogens and toxins, their bodies have a greater opportunity to absorb these chemicals through the skin that may increase risk for contracting occupational cancers. Sometimes these can be seen, such as with soot and charred debris, and sometimes they can't. If you knew you walked into a hazardous materials scene and became exposed to a chemical, wouldn't you wash off the affected area immediately? If your answer is yes, then do the same after a fire.

Firefighters may find it useful to consider every fire a hazardous materials scene with unknown poisons. At each fire scene, chemicals, plastics and other materials may be pyrolyzed and off-gas into harmful chemicals. Those chemicals can be extremely dangerous and must be washed off the body as soon as possible.

#### HAVING THE FACILITIES

Having showers at the fire station is essential now more than ever. Giving firefighters access to showers upon returning to the station is necessary. If your station does not currently have a shower in addition to bathrooms, consider getting one. There are many options besides doing a full remodel of the fire station. There are portable showers with pop-up walls around it for privacy, and many even have water heaters.

**Allowing firefighters to get into their vehicles and return home to shower is not an acceptable practice. This results in firefighters contaminating their vehicle as well as their home. These are places where family members, possibly children, can be exposed unnecessarily.** Giving firefighters the opportunity to shower at the station allows them to keep their soiled duty uniform at the station and allows them to clean their bodies as soon as possible.

As stated above, showering must be a high priority upon returning to the station. Incident commanders should consider getting the firefighters that have been exposed the longest in the worst conditions off the scene to clean up first. The concept of “first in, first out” is starting to catch on in terms of decontamination. Incident commanders need to give the firefighters who were exposed to the contaminants during the worst time of the incident the opportunity to decontaminate their skin as soon as possible. Ensure that adequate shower facilities are equally available to all responders, regardless of their gender identity.

## **GOING FORWARD**

It is one thing to know that showering has critical benefits to firefighters in the fight against cancer and that contaminants need to be washed off the skin as soon as possible. It is another thing to put it into practice. Every department likely has the capacity to make “shower within the hour” a standard operating procedure to which all firefighters need to adhere. If the department already has the facilities to allow members to shower prior to returning home, it doesn’t cost a thing except a small increase in the water bill. For those that don’t have the facilities, there will be a cost for upgrading the station or purchasing portable showers. In the end, the cost is worth it when it comes to protecting firefighters and avoiding a painful and costly battle with cancer.

The ability for firefighters to shower prior to leaving the station and not carry the contaminants home should be the norm, not the exception. Too many stories are told of firefighters throwing their gear in the trunk of their cars, hopping on their cloth seats in their personal vehicles and driving home to clean up. Allowing that to occur only helps the spread of the contaminants to their vehicles, homes and families. No one wants to put their family at risk unnecessarily. Why not allow firefighters to clean up and change clothes at the station instead of bringing the contaminants home to their families?

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## BEST PRACTICE 7:

**PPE, especially turnout pants, must be prohibited in areas outside the apparatus floor (i.e., kitchen, sleeping areas, etc.) and should never be in the living quarters.**



The kitchen and living quarters of the firehouse are not the location to store or wear PPE. It needs to be housed and used in the proper location in the apparatus bay or PPE storage area. This ensures the highest level of safety for firefighters who are assigned or working out of a particular fire facility.

Turnout gear can become contaminated with carcinogens every time a firefighter enters an atmosphere that has fire, smoke and the byproducts of combustion, including but not limited to acrylonitrile, arsenic, benzene, polycyclic hydrocarbons, cadmium, chlorophenols, chromium, carbon monoxide, dioxins, ethylene oxide, formaldehyde, orthotoluene, polychlorinated biphenyls and vinyl chloride (Roman, 2017). Research shows that all of these have either been proven to or are widely believed to cause cancer. That list of words that are hard to spell and even harder to pronounce are enough reason alone not to wear gear anywhere except at an emergency incident. And to be 100 percent safe, even if the turnout gear has been decontaminated, you should not wear it in the fire station, with the exception of the bay, gear storage and decon areas. Simply stated, we should make this a mindset and cultural shift concerning the fire station living areas.

*The National Fire Protection Association (NFPA) has set the standard for PPE in NFPA 1851: Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting. Refer to chapter 9 of this standard for proper storage of PPE, in particular 9.1.6. Senior leadership needs to work to instill a standard operating guideline or general operating policy that states, "PPE is prohibited anywhere in the fire station besides the apparatus floor or PPE storage areas." After implementing the new policy, the chief officers must enforce it and hold members accountable if they don't follow the rules. Failing to hold members accountable makes it nothing more than a fancy piece of paper.*

*The NVFC, in collaboration with the NFPA, released the guide Understanding and Implementing Standards: NFPA 1851 to help volunteer and combination departments implement this standard. A sample SOP is also provided on the NVFC website. These resources are available at [www.nvfc.org](http://www.nvfc.org).*

Online searches and training facilities can also provide sample documents and resources to help enforce this best practice. Currently, a large portion of training facilities are requiring firefighters to keep their PPE out of the classrooms and communal areas of their buildings. One agency that currently has a policy on this issue is the Westchester County Department of Emergency Services Training Facility in White Plains, New York. Their procedures explicitly state, "At no time is turnout gear to be worn into the classroom/office building. All turnout gear is to be removed outside of the glass entrance, gray doors, or garage doors. Turnout gear is to be kept outside or on the apparatus floor." (Westchester County, 2018)

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## BEST PRACTICE 8:

**Wipes, or soap and water, should also be used to decontaminate and clean apparatus seats, SCBA and interior crew areas regularly, especially after incidents where personnel were exposed to products of combustion.**

Following a fire scene, the apparatus and equipment need to be thoroughly cleaned with appropriate cleansing wipes or soap and water in order to eliminate contaminants and stop continued exposure potential to the firefighters. Each fire incident may be considered a toxic environment, and the apparatus and equipment need to be cleaned in the same way they would after a hazardous materials response.

Decontamination should be conducted immediately following an incident, especially when personnel were exposed to products of combustion. The use of cleansing wipes should also be used regularly to clean apparatus seats, SCBA and interior crew areas. The idea is to capture the areas where toxic substances may linger, especially the equipment and the cab of the apparatus. If these toxins are not eliminated, they may result in further exposure beyond the initial toxic environment and expose other members of our organization. Personal protective equipment should be worn when using the wipes. They have chemicals that deplete the toxic materials but may be full of things that can be easily absorbed by your skin.

Manufacturers of emergency vehicle apparatus have been actively designing new and improved decon enhancements. Some of these features include:

- HEPA air filtration systems for inside cabs that will circulate air, removing contaminated particles
- Creation of non-SCBA seats to help prevent contamination from air packs entering the cab
- Seat surfaces that enhance a cleaner environment inside the cab (this includes vinyl, which is easy to wipe down, or fabrics with antimicrobial and antipathogenic barriers)
- External transverse compartments across the back of the cab to store SCBAs on a pullout board for easier access; transverse body compartments are unique in their availability to do the same within a commercial chassis product
- Exterior compartments for the storage of bunker gear with exterior access only
- Garden hose outlets on pump panels that provide a pressure-regulated and temperature-controlled water supply for gross decontamination of firefighters
- Inclusion of automated dispensing of disinfectant inside the cab, thus reducing first responder exposure to harmful pathogens.

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## BEST PRACTICE 9:

Get an annual physical, as early detection is the key to survival.

### FIND CANCER EARLY

*“An ounce of prevention is worth a pound of cure”*

Benjamin Franklin

**Early detection saves lives.** The American Cancer Society (ACS) states, “screening increases the chances of detecting certain cancers early, when they are most likely to be curable” (*Cancer Screening Guidelines*). The overall death rate from cancer in the United States has declined steadily over the past two decades, according to annual statistics reported by the ACS. The drop-in cancer mortality is mostly due to steady reductions in smoking and advances in early detection and treatment (Simon, 2018). Learn more at [www.cancer.org/healthy/find-cancer-early.html](http://www.cancer.org/healthy/find-cancer-early.html).

According to a study conducted by NIOSH, firefighters have a 9 percent higher risk of being diagnosed with cancer and a 14 percent higher risk of dying from cancer than the general U.S. population (Daniels, 2017). It is also important to note that firefighters’ risks are significantly higher for some specific types of cancer. Due to this, it is especially important that firefighters get an annual physical and make sure their healthcare provider knows of their increased cancer risks. For more information and access to the NIOSH Report, visit <https://firefightercancersupport.org/resources/library> and <https://blogs.cdc.gov/niosh-science-blog/2017/05/10/ff-cancer-facts/>.

### GUIDELINES AND STANDARDS REGARDING ANNUAL PHYSICALS

The National Fire Protection Association’s 1582 standard provides guidelines regarding medical programs for fire departments and recommends annual physicals for prevention of disease. The standard’s purpose is to reduce the risk of fire service occupational morbidity and mortality while improving the safety and efficiency of firefighters.

NFPA 1582: Standard on Comprehensive Occupational Medical Program for Fire Departments includes the following direction for departments and personnel:

#### Chapter 4: Roles and Responsibilities of Fire Departments

**4.1.1** The fire department shall establish a comprehensive occupational medical program that includes medical evaluation for candidates and members.

**B.4** Coordinating the Medical Evaluation Program. An individual from within the department should be assigned the responsibility to manage the health and fitness program, including the coordination and schedule of evaluations and examinations. This person should also act as a liaison between the department and the physician to make sure that each has the information necessary for decisions about placement, scheduling appointments and so forth.

#### Chapter 7: Timing of the Annual Occupational Medical Evaluation

**7.3.3** The annual evaluation shall be completed every 12 months.

**7.4.2** It shall be acceptable for certain components of the annual occupational medical evaluation to be performed by a member’s private physician, provided full results are forwarded in the required time frame to the fire department physician.

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## RESOURCES TO ASSIST WITH AN ANNUAL PHYSICALS PROGRAM

The IAFC published a comprehensive report on understanding and using NFPA 1582 and the IAFF/IAFC Wellness-Fitness Initiative. Information and sample documents are included to assist with the education and implementation of an annual medical evaluation program. The Emergency Services Road Map to Health and Wellness, available at [iafc.org/healthRoadmap](http://iafc.org/healthRoadmap) provides an in-depth look at issues that firefighters face in regards to cancer and other life-threatening illnesses.



## A HEALTHCARE PROVIDER'S GUIDE TO FIREFIGHTER PHYSICALS

**YOUR PATIENT IS A FIREFIGHTER!**



[www.iafc.org/healthRoadmap](http://www.iafc.org/healthRoadmap)

Many firefighters, especially volunteers, utilize their own personal physician to conduct their annual medical evaluation. These healthcare providers may not know the increased risks and challenges firefighters face. The IAFC, in collaboration with Firefighter Safety Through Advanced Research, created the *Healthcare Provider's Guide to Firefighter Physicals* to assist healthcare providers in the evaluation, treatment and ongoing surveillance of the health and wellness of firefighters. The recommendations in this document are supported by ongoing clinical research of firefighters' health and by the extensive experience and expertise of the providers caring for them. These recommendations are offered as assistance for healthcare providers making clinical decisions regarding the medical fitness and treatment of firefighters. Firefighters are encouraged to bring the guide to their next annual physical. Download it at [iafc.org/healthRoadmap](http://iafc.org/healthRoadmap).

The NVFC "Position on Firefighter Medical Assessments" provides options to assist volunteer and combination departments in establishing an assessment program. The document outlines four different types of annual physicals that could be adopted depending on the resources available to the department and the individual firefighter. This document is available on the NVFC web site at [www.nvfc.org/wp-content/uploads/2017/04/NVFC-Position-on-Firefighter-Medical-Assessments.pdf](http://www.nvfc.org/wp-content/uploads/2017/04/NVFC-Position-on-Firefighter-Medical-Assessments.pdf).

The best way to diminish the impact of any disease, illness, or injury is to detect it as early as possible. This is especially true for firefighters who, in many cases, are at greater risk for certain diseases, illnesses and injuries than the general population. To help facilitate an early diagnosis, healthcare providers need to have an increased awareness of the risks and firefighters must have annual physicals to catch any abnormalities.

## LISTEN TO THE EXPERTS

From genetics to the environment, many factors affect a person's risk of contracting cancer. Get the facts on what you can do to help protect yourself and your loved ones. Your department and your family depend on you and need you to be the healthiest version of yourself.

Recognizing your vulnerability to illness is the first step to adopting and implementing a regimen that will support your health as you continue to serve others at their worst time and be there for your family.

Making healthy choices can help reduce the risk of cancer. Here are some tips from the American Cancer Society.

- Stay away from all forms of tobacco.
- Get to and stay at a healthy weight.
- Get moving with regular physical activity.
- Eat healthy with plenty of fruits and vegetables.
- Limit how much alcohol you drink.
- Protect your skin.
- Know yourself, your family history and your risks.
- **Get regular checkups and cancer screening tests. It is also important to follow recommended screening guidelines, which can help detect certain cancers early.**

The Firefighter Cancer Support Network (FCSN) provides assistance and one-on-one mentoring to thousands of cancer-stricken firefighters and their families. FCSN also delivers extensive firefighter cancer awareness and prevention training nationwide.

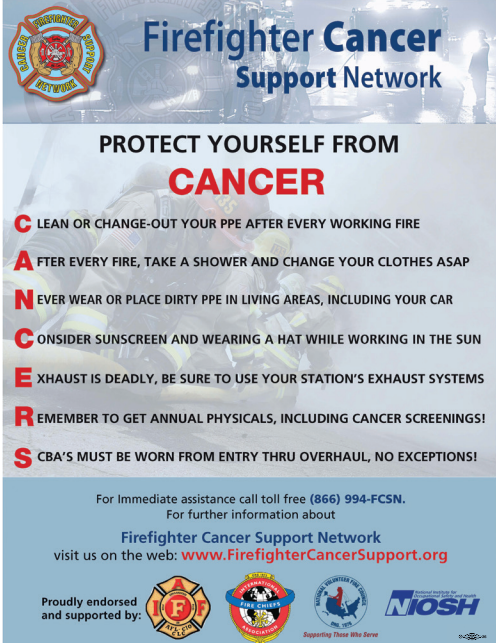
## UTILIZE BEST PRACTICES

A best practice is a method or technique that identifies a standard way of doing something that multiple organizations can use and adopt. Volunteer and smaller departments may not have the resources or budget to independently develop a comprehensive cancer prevention program, but there are many existing resources that can be used and easily incorporated.

For example, The Healthy-In, Healthy-Out program includes a manual called *Best Practices for Reducing Firefighter Risk to Exposure to Carcinogens*. Annual physicals are discussed throughout the manual, along with suggestions on how to finance and conduct them. Funding and support for the Healthy-In, Healthy-Out project was provided by the State of Washington's Department of Labor and Industries, Safety and Health Investment Projects.

Washington has also adopted a policy requiring a medical exam for any employee prior to being assigned to work in an area that may release carcinogens. This includes an annual recommended physical for incumbent firefighters. These exams are to be provided at no cost to the employee and provided annually after an initial examination. Specific tests such as red and white blood cell count tests, heavy-metals screenings and cancer screenings may assist with early detection of many common cancers. These simple exams may be able to determine if cancer is a risk or currently present.

If no policy exists at your department, talk to leadership about creating one.



The poster features a fire scene background with a firefighter in the foreground. At the top left is the Firefighter Cancer Support Network logo, which includes a Maltese cross with 'FIRE' and 'SUPPORT' and the motto 'FIGHTING FOR THE FUTURE'. The title 'Firefighter Cancer Support Network' is in blue and white. Below the title, the text 'PROTECT YOURSELF FROM CANCER' is displayed, with 'CANCER' in large red letters. A list of seven 'C' words provides key safety and health advice: CLEAN OR CHANGE-OUT YOUR PPE AFTER EVERY WORKING FIRE; AFTER EVERY FIRE, TAKE A SHOWER AND CHANGE YOUR CLOTHES ASAP; NEVER WEAR OR PLACE DIRTY PPE IN LIVING AREAS, INCLUDING YOUR CAR; CONSIDER SUNSCREEN AND WEARING A HAT WHILE WORKING IN THE SUN; EXHAUST IS DEADLY, BE SURE TO USE YOUR STATION'S EXHAUST SYSTEMS; REMEMBER TO GET ANNUAL PHYSICALS, INCLUDING CANCER SCREENINGS!; SCBA'S MUST BE WORN FROM ENTRY THRU OVERHAUL, NO EXCEPTIONS! At the bottom, contact information is provided: 'For Immediate assistance call toll free (866) 994-FCSN. For further information about Firefighter Cancer Support Network visit us on the web: www.FirefighterCancerSupport.org'. Logos for the International Association of Fire Chiefs, Firefighter Cancer Support Network, and NIOSH are shown at the bottom.

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## BEST PRACTICE 10:

### **Tobacco products of any variety, including dip and e-cigarettes, should never be used at any time, on or off duty**

Tobacco use has steadily dropped over the past 50 years in the United States according to a report published in 2014 by the Surgeon General. What once was a social norm has seen a steady decline, largely due to efforts to reduce tobacco use based on the research of the health issues it causes. Despite this decline, the CDC still reports that the single largest preventable cause of death and disease in the United States is tobacco use. The healthcare cost from tobacco use of adults in America alone is almost \$170 billion (Xu X et al., 2014). Even though it was estimated that in 2016 only 15.5 percent of the adult population smoked, it remains a major health problem (*Smoking & Tobacco Use*, 2018).

The negative health effects of tobacco aren't reserved only for smokers. Tobacco use and the introduction of its chemicals into the body also exist through secondhand smoke, smokeless tobacco and now e-cigarettes, also known as vapor products.

Just some of the chemicals found in tobacco smoke include arsenic, benzene, cadmium, formaldehyde and toluene. Firefighters should recognize these chemicals as things that are dangerous on incident scenes, yet those who smoke are willingly putting them into their bodies. After taking great care to reduce exposure to the cancer-causing carcinogens on scene and taking the steps to decon both our equipment and ourselves, why go against these efforts by willingly ingesting these toxins? The chances of getting cancer increases when the factors encountered on the job are coupled with the risks of cancer related to tobacco use.

The types of cancers caused by the chemicals in tobacco range from cancer of the bladder, cervix, colon, esophagus, kidney, larynx, liver, lungs, mouth, pancreas, rectum, stomach and throat. Most firefighters have seen the effects of cancer, whether on patients to whom they've responded, a fellow firefighter, or even someone in their family. The impact of cancer on the patient's life, finances and family are significant. Why would anyone want to increase their chances of getting this disease?

Change must start with us. Those who use tobacco must take the necessary steps to quit. This will reduce the cancer risk in themselves, their families and those close to them. Departments should also adopt and enforce a no tobacco policy to prevent personnel from using tobacco on department property.

Tobacco use doesn't just impact the user. The National Cancer Institute reports that more than 7,000 chemicals have been identified in secondhand smoke, and 69 of those chemicals cause cancer. In addition, 250 of those chemicals are harmful to our bodies, even to the extent of damaging the DNA (*Secondhand Smoke*, 2011). By using tobacco, spouses, children, friends and fellow department members are exposed to chemicals that can reduce the quality of their life and ultimately decrease their life span. This exposure is something that, often times, they don't have a choice in. Many government entities have passed laws restricting smoking from restaurants and other gathering places. They recognize the harmful attributes of secondhand smoke and have taken steps to protect the public. Shouldn't firefighters seek to equally protect those in their lives they are closest to?

E-cigarettes aerosolize the chemicals into a dense fog of liquid droplets that can penetrate the lungs and thus deliver the chemicals deep inside the body. These devices are currently unregulated by the U.S. Food and Drug Administration (FDA), and their effects are not fully known. However, the liquids usually contain nicotine and may become habit forming. The flavors used in these devices also have many chemicals, which currently have unknown effects as the research is so new.

Quitting is not easy, but the rewards are well worth the effort. There are immediate health benefits to quitting smoking, and those benefits compound greatly over time. Just within a few hours of quitting, the levels of carbon



monoxide decrease in the blood (*Benefits of Quitting*, 2016). As time continues to pass, blood pressure levels begin to move closer to normal, as does one's heart rate. Long-term benefits include lower risks of cancer and heart disease. These benefits can lead to a longer life expectancy. For those already diagnosed with cancer, quitting smoking may reduce the risk of dying, as it helps improve the body's ability to heal.

A support network of both family and friends can help an individual with quitting. If someone else has chosen to quit smoking tobacco, then they could become each other's accountability partners. This helps in providing someone that can offer support during difficult times, and it is someone who will understand the issues with stopping tobacco use. Positive reinforcement from family and coworkers can give a moral boost, and it can assist with one's sense of accomplishment as they reach milestones of being tobacco free. Department members should seek to help and support each other in the quest to be healthier while resisting the urge to shame or guilt someone into better choices. The latter of these usually results in bitter feelings and pushes someone away instead of helping them.

Many employers and their insurance providers offer assistance programs to aid in workers seeking to improve their health. This can be seen as a self-serving goal, but one that can be used to an individual's benefit in working to lead a healthier lifestyle. The benefits to the insurance company are a potential reduction in healthcare cost due to reduced claims from employees choosing a healthier lifestyle. The employers benefit from a healthier workforce by having more productive and reliable employees. The employer could also benefit from reduced health insurance premiums and less lost work time. These insurance premium savings by the employer could be passed on to the employees through a reduction in the insurance cost that they pay.

Several insurers also have rewards programs for quitting tobacco use and maintaining a healthy lifestyle. The insurers may offer an assistance program to quit tobacco use while rewarding the employee with incentives for their progress. These incentives can be a great way of motivating someone, as some programs offer points that equate to gift cards for retail and online stores. The employee wins all around in that they are improving their health, which can lead to a longer lifespan with fewer health issues and less stress, and quitting tobacco could be a boost in their finances with the money they used to spend on tobacco products being saved.

Help with quitting smoking is also available from many other sources. The National Cancer Institute provides several types of assistance. [Smokefree.gov](http://Smokefree.gov) provides free, accurate, evidence-based information and professional assistance to help support the immediate and long-term needs of people trying to quit smoking. Additional information is also available from the U.S. Department of Health and Human Services at [betobaccofree.hhs.gov](http://betobaccofree.hhs.gov). These are only a couple of the many resources that are available for those seeking to stop using tobacco products. The benefits are well worth the effort, not only to the person quitting, but to their family and friends as well.

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## **BEST PRACTICE 11:**

### **Fully document all fire or chemical exposures on incident reports and personal exposure reports.**

The adage, "If you didn't write it down, then it didn't happen," is never truer than in dealing with cancer in the fire service. Cancer does not present itself immediately after one is exposed to carcinogens. Thus, years later when the firefighter is diagnosed with cancer, the exact cause or procuring circumstances that exposed the individual to the harmful substances may be a long-forgotten memory. Therefore, it is important to have a process and to follow that process, to attempt to document as much detail regarding potential exposure, no matter the size of the incident or circumstance.

Through documentation, a clearer picture is painted that correlates exposures to the health risks associated with those exposures. This is helpful for departments in identifying risks and implementing changes to minimize those risks. It also gives the firefighter a record that he or she can carry to their physician so that the physician is aware of exposure to any possible cancer-causing carcinogen. It additionally provides a record of exposure that could make a claim for benefits less likely to be denied should any health issues arise in the future in relation to the exposure.

The first step in documentation starts well before a firefighter ever responds to an incident and involves fit-for-duty criteria and the basic outfitting that all departments should have in place for their personnel. This includes annual physicals to ensure that a firefighter is in good health and able to perform the essential functions of the job. This physical can be the baseline that correlates with exposure records to define a recognizable course if a firefighter is diagnosed with cancer. The process of having a regular physical can also lead to early detection and treatment of not only cancer but other potential health issues that personnel face as well, and regular physicals can result in a firefighter maintaining a healthier lifestyle overall.

The second part of the baseline process involves documentation of the firefighter's protective ensemble, the training to properly don and doff that equipment and the proper care for their equipment. While protective gear does not provide a complete barrier to the carcinogens, it is a measure of protection from direct exposure. Documentation in this aspect begins with ensuring that personnel are equipped with properly fitted gear that has been inspected to ensure that the gear is in good condition per the manufacturer's specifications. This will continue throughout the firefighter's entire time with the department and should be maintained after they leave the department per the records retention policy of the agency. It is also important to document the type, construction and age of the equipment.

The greatest amount of documentation will come from on-the-job exposures. While most departments document certain aspects of calls to account for personnel on scene, times of actions and other measurable events, they are generally hard pressed to give an account of everyone's time in the IDLH environment and even more so during overhaul. A clear and concise narrative can account for many details without causing an undue burden on the department personnel. It could include documenting the known or evident materials burned or otherwise aerosolized that could be inhaled or that could come in direct contact with the firefighter. Absorption can come through the skin, and that possibility may be increased during extreme physical exertion.

Scene documentation should begin as part of the basic report. This is what most firefighters are accustomed to, as they complete an incident report for each run made. The basic incident report can account for apparatus times on scene and subsequently times on scene for the personnel staffed on those apparatus, and it can indicate placement of apparatus in relation to the incident, individual assignments and atmospheric or weather conditions. These factors are all important pieces of the fire report, and they can aid in both an investigation of an incident, if it is so warranted, and documentation of potential exposures of personnel on scene.

Tracking exposures of personnel on scene is not limited to those responders in the IDLH hot zone atmosphere. Command and support personnel can be exposed at varying degrees throughout an incident. Previous best practices in this report have covered decon of personnel and equipment, but this process can also be a source of exposure if proper PPE is not worn.

For the responders that are in the IDLH, documentation should be kept as to their roles at the scene. This can be as simple as notating who did what activities in the overall narrative. For example, people performing a search may have a greater exposure to the hand area since their gloves are exposed to contaminants as they crawl on the floor. People outside the IDLH may have exposure to hands, neck and face since they are wearing bunker gear but not necessarily their hoods, gloves or SCBA. A careful job hazard analysis can identify potential sources of exposure for each type of event, and this can be used to aid in the identification of exposures while on scene.

Another part of the scene documentation could come if an investigation is done of the incident. During an investigation, substances that were consumed in the fire may be more accurately identified, and this coupled with the previous scene documentation can provide a more accurate exposure picture. These records could be invaluable to establishing confirmed exposure should a responder develop cancer many years down the road. They can also be part of reviewing how to best protect firefighters in the future.

Despite the burden of seeking to document all the information possible, this should be made a priority. The more data that is available, the better we can help ourselves in the fight against this deadly disease.

Past scene documentation as well as job and workplace hazard analysis can help to identify sources of exposure to carcinogens (or other hazards) that might not be readily apparent. An example would be the process for gear washing after an exposure. After an incident with exposure, gear that has been exposed and thus must be washed needs to be handled in a manner that limits exposure for the person tasked with cleaning the gear. This can be aided by a job description and procedure that minimizes any hazard to personnel. Another exposure could be from diesel exhaust fumes in apparatus bays. Without the presence of a means to filter the exhaust, it becomes an exposure hazard to rescuers and other people in the station. Documentation can be both a means to identify where someone encountered carcinogens as well as a means to justify policy changes and mitigation efforts to reduce the carcinogen hazard.

Remember that the job of documentation begins with the chief to set the example for all to follow.

In order to serve our citizens, we must first take care of ourselves and our responders. Documentation can be viewed as a chore, or it can be looked at as a tool to better the workplace and working conditions and aid in helping treat and assist those that have already been exposed to the carcinogen hazards they routinely face.

Because of the direct connection between the toxins and carcinogens on fire scenes and firefighter cancer, documentation of exposures at all incidents has become a priority in the fight against occupational cancer. Tracking exposures can help firefighters better understand their risks, more effectively communicate these risks to their healthcare provider and provide needed documentation to receive benefits if they contract cancer caused by on-the-job exposures. The First Responder Center for Excellence ([www.firstrespondercenter.org/cancer](http://www.firstrespondercenter.org/cancer)) and the National Volunteer Fire Council ([www.nvfc.org](http://www.nvfc.org)) both provide more information regarding

documentation of exposures as well as sample exposure tracking forms that firefighters, chiefs and line officers can use to document incident exposure. Various educational items, instructional tools and standard operating guidelines (SOGs) in the fight against cancer can also be found on these websites.

Tracking exposure data for incidents that firefighters respond to—the frequency, the duration, the time off to recover and the PPE used—can also help to identify patterns. By using either premade forms or purchased tracking programs, these patterns can show levels of probability for developing chronic illnesses from the tasks firefighters face daily, while helping the fire service develop plans to alleviate these illnesses in the future. One example is [firstforward.com](http://firstforward.com), which provides online tracking with unlimited records. The need to address exposure tracking through each department’s standard operating guidelines is a step in the right direction toward alleviating occupational cancer and providing a healthy, competent response team.



# Occupational Exposure Tracking Form

Name: \_\_\_\_\_ Agency: \_\_\_\_\_

Position: \_\_\_\_\_ Unit: \_\_\_\_\_

## Incident Information

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Incident #: \_\_\_\_\_

Street Address: \_\_\_\_\_

City: \_\_\_\_\_ Zip: \_\_\_\_\_

## Incident Type *(Description of this incident)*

- |   |  |                                  |
|---|--|----------------------------------|
| <input type="checkbox"/> Structure Fire | <input type="checkbox"/> Heavy Rescue  | <input type="checkbox"/> Standby |
| <input type="checkbox"/> Car Fire       | <input type="checkbox"/> EMS Incident  |                                  |
| <input type="checkbox"/> Hazmat         | <input type="checkbox"/> Investigation |                                  |
| <input type="checkbox"/> Other _____    |  |                                  |

## Personal Protection Equipment *(List of PPE used during this incident)*

- |                                       |  |  |
|---------------------------------------|--|--|
| <input type="checkbox"/> Helmet       | <input type="checkbox"/> SCBA                    | <input type="checkbox"/> B-95            |
| <input type="checkbox"/> Bunker Coat  | <input type="checkbox"/> Suppression Boots       | <input type="checkbox"/> Station Uniform |
| <input type="checkbox"/> Bunker Pants | <input type="checkbox"/> Suppression/Work Gloves | <input type="checkbox"/> Station Boots   |
| <input type="checkbox"/> Fire Hood    | <input type="checkbox"/> Safety Glasses          | <input type="checkbox"/> Safety Glasses  |
| <input type="checkbox"/> Other _____  |  |  |

## Operational Role *(List of roles assumed during this incident)*

- |   |   |
|---|---|
| <input type="checkbox"/> Interior Fire Operations | <input type="checkbox"/> Interior Investigations/Monitoring |
| <input type="checkbox"/> Exterior Fire Operations | <input type="checkbox"/> Driver/Pumper Operations           |
| <input type="checkbox"/> Overhaul                 | <input type="checkbox"/> Standby                            |
| <input type="checkbox"/> Other _____              |   |

## Possible Exposures *(List of potential hazardous materials encountered during this incident)*

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> Products of Combustion | <input type="checkbox"/> Hazardous Materials | <input type="checkbox"/> Airborne Dust  |
| <input type="checkbox"/> Carbon Dioxide         | <input type="checkbox"/> Construction Debris | <input type="checkbox"/> Diesel Exhaust |
| <input type="checkbox"/> Other _____            |  |   |

## Signs/Symptoms *(List of signs or symptoms experienced during or after this incident)*

- |                                      |                                     |                                   |
|--------------------------------------|-------------------------------------|-----------------------------------|
| <input type="checkbox"/> Cough       | <input type="checkbox"/> Head Ache  | <input type="checkbox"/> Nausea   |
| <input type="checkbox"/> Wheeze      | <input type="checkbox"/> Chest Pain | <input type="checkbox"/> Vomiting |
| <input type="checkbox"/> Sore Throat | <input type="checkbox"/> Dizziness  | <input type="checkbox"/> None     |
| <input type="checkbox"/> Other _____ |                                     |                                   |

Notes: \_\_\_\_\_

Courtesy Fire Service Occupational Cancer Alliance Tool Kit.

For more information, visit [firstrespondercenter.org/cancer](http://firstrespondercenter.org/cancer)

# CALL TO ACTION

By

Chief James Seavey Sr., VCOS Cancer Committee and  
Past Chief Brian F. McQueen, NVFC Cancer Committee

Over the past five years, our fire stations, printed media and social media platforms have been filled with the issues that we, as firefighters, face with cancer. Cancer is a life-threatening epidemic that needs to be addressed just as much as we address heart and PTSD issues. Statistics on firefighter cancer have shown that firefighters have a 9 percent higher risk of being diagnosed with cancer and a 14 percent higher risk of dying from cancer than the general U.S. population (Daniels, 2017). It may be hard for a lot of people to comprehend the magnitude of the fire service cancer epidemic. You might have even seen the ultraviolet light photos of the carcinogens sitting on your body after a fire. To some, the statistics and photos are unreal or questionable. To us, they are not!

Both of us have been diagnosed with cancer, which may have been attributed to our jobs as career and volunteer firefighters. When an oncologist pulls you into his room and informs you and your loved one that you have cancer, your life changes forever. It goes much deeper than the physical attributes of occupational cancer. Once you gather yourself and understand the serious effects of cancer on your body and on your family, then and only then will you realize that the steps taken during your active duty will be what allows you to fulfill your dreams as a firefighter. Both of us believed that the dirty, salty-looking gear was a badge of courage in our stations. New recruits thought of us as the working firefighters, those who put their lives on the line every day and didn't worry about the way we looked. Never did we realize that wearing SCBA throughout the entire incident, deconning ourselves at the fire, showering after a fire or washing our hoods would be best practices that could have saved us from going through the pain and suffering that we currently face in our treatment processes.

We often share our stories with our colleagues and friends. So often they are intrigued with our stories of our battles with cancer. One critical point we all need to remember is that the health and safety choices that we make as first responders impact not only us, but our crew and those we come home to. We must realize that the healthier we are, the better off we will be for beating cancer. And the more diligent we are in protecting ourselves from carcinogens and toxic exposures, the more we lessen our risks of developing occupational cancer. The best practices covered in this report make us healthier and stronger, and they enable us to be there for our families and our crew.

This Lavender Ribbon Report is a joint effort between the VCOS and NVFC Cancer Committees. It is our hope that you take this call to action as leaders in our fire service, share it with your line officers and embed the "11 Best Practices to Preventing Firefighter Cancer" into your daily standard operating guidelines. The work that you do now will provide a better environment for your firefighters while providing some reassurance to their families that their health and safety is your top concern.

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# ADDITIONAL RESOURCES

**American Cancer Society:**

[www.cancer.org/cancer.html](http://www.cancer.org/cancer.html)

**Firefighter Cancer Support Network:**

[www.firefightercancersupport.org/](http://www.firefightercancersupport.org/)

**Firefighterclosecalls.com:**

[www.firefighterclosecalls.com/](http://www.firefighterclosecalls.com/)

**FireRescue1:**

[www.firerescue1.com/cancer/](http://www.firerescue1.com/cancer/)

**First Responder Center for Excellence for  
Reducing Occupational Illness, Injuries and Deaths:**

[www.firstrespondercenter.org/cancer/](http://www.firstrespondercenter.org/cancer/)

**First Responder Center for FSTAR Research:**

[www.fstaresearch.org/](http://www.fstaresearch.org/)

**International Association of Fire Chiefs:**

[www.iafc.org/](http://www.iafc.org/)

**National Cancer Institute:**

[www.cancer.gov/](http://www.cancer.gov/)

**National Fire Protection Association:**

[www.nfpa.org/](http://www.nfpa.org/)

**National Volunteer Fire Council:**

[www.nvfc.org/](http://www.nvfc.org/)

**Safety, Health and Survival Section of the IAFC:**

[www.iafcsafety.org/](http://www.iafcsafety.org/)

**The National Institute for Occupational Safety and Health (NIOSH):**

[www.cdc.gov/niosh/firefighters/injury.html](http://www.cdc.gov/niosh/firefighters/injury.html)

**Volunteer and Combination Officers Section of the IAFC:**

[www.vcos.org](http://www.vcos.org)

# **SPECIAL THANKS**

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**The National Firefighter Cancer Support Network**

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